SEQUENCE LISTING

<110> Washington University

<120> Regulated Attenuation of Live Vaccines to Enhance Cross-Protective Immunogenicity

<130> 56029-40434

<140> PCT/US03/11802

<141> 2003-04-15

<150> US 60/373,626

<151> 2002-04-18

<150> US 60/372,616

<151> 2002-04-15

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<170> PatentIn version 3.1

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Lys Lys Lys Ala Glu Glu Ala Thr Lys Glu Ala Glu Val Ala Lys Lys
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Lys Ser Glu Glu Ala Ala Lys Glu Val Glu Val Glu Lys Asn Lys Ile
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Leu Glu Gln Asp Ala Glu Asn Glu Lys Lys Ile Asp Val Leu Gln Asn
85 90 95

Lys Val Ala Asp Leu Glu Lys Gly Ile Ala Pro Tyr Gln Asn Glu Val
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Ala Glu Leu Asn Lys Glu Ile Ala Arg Leu Gln Ser Asp Leu Lys Asp
115 120 125

Ala Glu Glu Asn Asn Val Glu Asp Tyr Ile Lys Glu Gly Leu Glu Gln
130 135 140

Ala Ile Thr Asn Lys Lys Ala Glu Leu Ala Thr Thr Gln Gln Asn Ile
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Asp Lys Thr Gln Lys Asp Leu Glu Asp Ala Glu Leu Glu Leu Glu Lys
165 170 175

Val Leu Ala Thr Leu Asp Pro Glu Gly Lys Thr Gln Asp Glu Leu Asp
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Lys Glu Ala Ala Glu Ala Glu Leu Asn Glu Lys Val Glu Ala Leu Gln
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Glu Glu Met Asp Lys Ala Val Ala Ala Val Gln Gln Ala Tyr Leu Ala
65 70 75 80

Tyr Gln Gln Ala Thr Asp Lys Ala Ala Lys Asp Ala Ala Asp Lys Met
85 90 95

Ile Asp Glu Ala Lys Lys Arg Glu Glu Glu Ala Lys Thr Lys Phe Asn
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Thr Val Arg Ala Met Val Val Pro Glu Pro Glu Gln Leu Ala Glu Thr
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145 150 155 160

Thr Glu Ala Lys Gln Lys Val Asp Ala Glu Glu Val Ala Pro Gln Ala
165 170 175

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Lys Glu Ile Asp Glu Ser Glu Ser Glu Asp Tyr Ala Lys Glu Gly Phe
195 200 205

Arg Ala Pro Leu Gln Ser Lys Leu Asp Ala Lys Lys Ala Lys Leu Ser

210 215 220

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35 40 45

Lys Lys Lys Ala Glu Glu Ala Thr Lys Glu Ala Glu Val Ala Lys Lys
50 55 60

Lys Ser Glu Glu Ala Ala Lys Glu Val Glu Val Glu Lys Asn Lys Ile
65 70 75 80

Leu Glu Gln Asp Ala Glu Asn Glu Lys Lys Ile Asp Val Leu Gln Asn
85 90 95

Lys Val Ala Asp Leu Glu Lys Gly Ile Ala Pro Tyr Gln Asn Glu Val
100 105 110

Ala Glu Leu Asn Lys Glu Ile Ala Arg Leu Gln Ser Asp Leu Lys Asp
115 120 125

Ala Glu Glu Asn Asn Val Glu Asp Tyr Ile Lys Glu Gly Leu Glu Gln
130 135 140

Ala Ile Thr Asn Lys Lys Ala Glu Leu Ala Thr Thr Gln Gln Asn Ile
145 150 155 160

Asp Lys Thr Gln Lys Asp Leu Glu Asp Ala Glu Leu Glu Leu Glu Lys
165 170 175

Val Leu Ala Thr Leu Asp Pro Glu Gly Lys Thr Gln Asp Glu Leu Asp
180 185 190

Lys Glu Ala Ala Glu Ala Glu Leu Asn Glu Lys Val Glu Ala Leu Gln
195 200 205

Asn Gln Val Ala Glu Leu Glu Glu Glu Leu Ser Lys Leu Glu Asp Asn
210 215 220

Leu Lys Asp Ala Glu Thr Leu Gln Ser Pro Val Ala Ser Gln Ser Lys
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Gln Lys Lys Tyr Asp Glu Asp Gln Lys Lys Thr Glu Glu Lys Ala Ala
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Gln Gln Ala Tyr Leu Ala Tyr Gln Gln Ala Thr Asp Lys Ala Ala Lys
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Ala Lys Thr Lys Phe Asn Thr Val Arg Ala Met Val Val Pro Glu Pro
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Glu Gln Leu Ala Glu Thr Lys Lys Lys Ser Glu Glu Ala Lys Gln Lys
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Glu Ala Glu Lys Lys Ala Thr Glu Ala Lys Gln Lys Val Asp Ala Glu
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Lys Lys Ala Lys Leu Ser Lys Leu Glu Glu Leu Ser Asp Lys Ile Asp
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Glu Glu Asn Asn Asn Val Glu
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